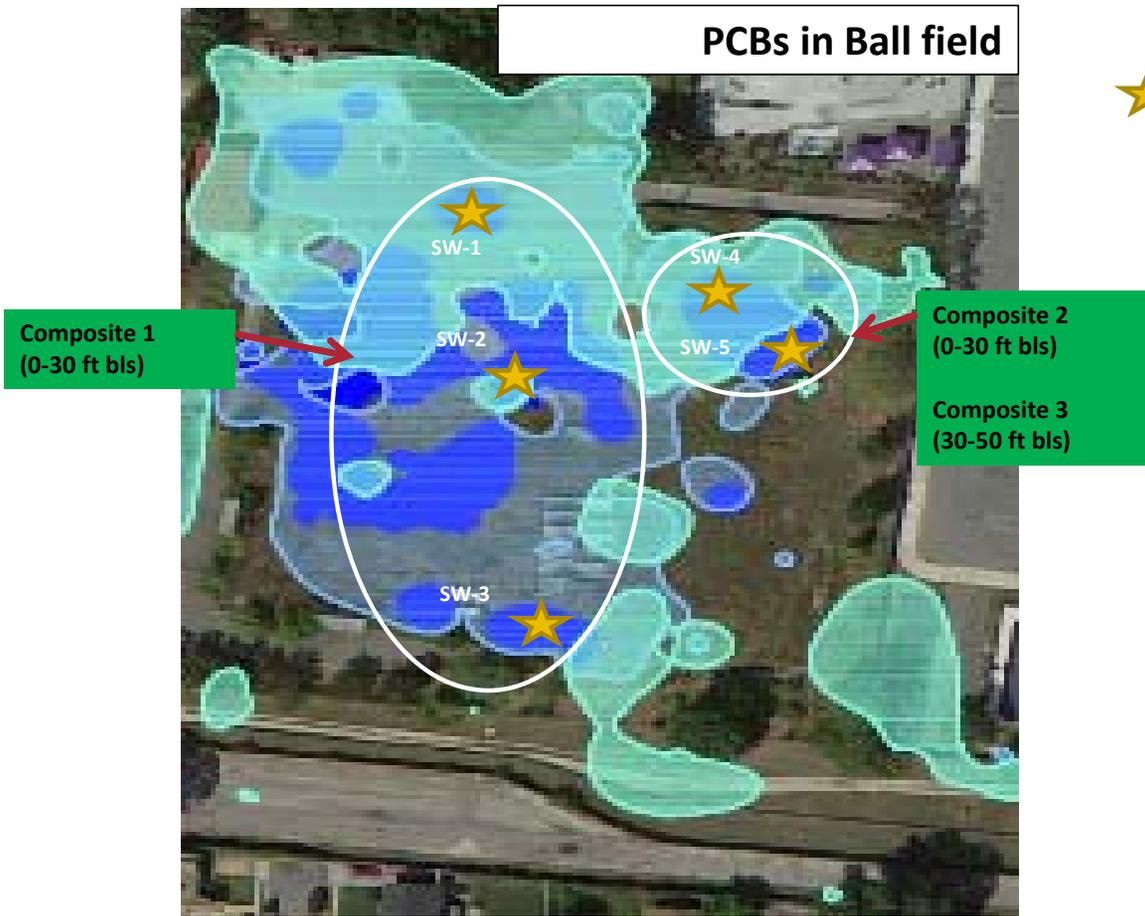


# Soils Washing Treatability Plan



Proposed Soil Washing Treatability Boring Location

- Sample IDs SW-1 through SW-5
- The circled sets of borings will be composited at the lab
- Locations subject to mark out of utilities and review of soil type from existing borings

Key

- PCBs > 1 ppm 0-2 ft
- PCBs > 10 ppm 2-10 ft
- PCBs > 50 ppm

## Soil Washing Bench Test Summary May 28, 2015

### Field Work

- Collected five soil borings
  - SW-1 - 0-30 feet
  - SW-2 – 0-30 feet
  - SW-3 – 0-30 feet
  - SW-4 – 0-30 feet, 30-50 feet
  - SW-5 – 0-30 feet, 30-50 feet
- Cores shipped to ART in Tampa

## Soil Washing Bench Test Summary May 28, 2015

- Bench Work
  - Composite #1
    - SW-1 - 0-30 feet
    - SW-2 – 0-30 feet
    - SW-3 – 0-30 feet
  - Composite #2
    - SW-4 – 0-30 feet
    - SW-5 – 0-30 feet
  - Deep samples (30-50 feet) were sent just for visual observation
  - Composite samples shipped for analysis
  - Step #1 – physical separation performed on the composite samples

Table 1: Results Initial Soil Analysis - Composites 1, 2 and 3

Analytical Parameter	Units	Composite 1	Composite 2	NYSDEC Part 375 Restricted Residential SCO (0 - 40 ft)	Composite 3	NYSDEC Part 375 Protection of GW SCO (40 - 50 ft)
		NG-C1-01	NG-C2-01		NG-C3-01	
Acetone	mg/kg	0.014 J	N.D.	100	N.D.	0.05
Benzene	mg/kg	N.D.	N.D.	4.8	N.D.	0.06
Methyl Ethyl Ketone (2-Butanone)	mg/kg	N.D.	N.D.	100	N.D.	0.12
Carbon Disulfide	mg/kg	0.003 J	N.D.	NS	N.D.	NS
Carbon Tetrachloride	mg/kg	N.D.	N.D.	2.4	N.D.	0.76
Chlorobenzene	mg/kg	N.D.	N.D.	100	N.D.	1.1
Chloroform	mg/kg	N.D.	N.D.	49	N.D.	0.37
1,2-Dichlorobenzene	mg/kg	0.002 J	N.D.	100	N.D.	1.1
1,3-Dichlorobenzene	mg/kg	N.D.	N.D.	49	N.D.	2.4
1,4-Dichlorobenzene	mg/kg	N.D.	N.D.	13	N.D.	1.8
1,1-Dichloroethane	mg/kg	0.003 J	0.096 J	26	N.D.	0.27
1,2-Dichloroethane	mg/kg	N.D.	N.D.	3.1	N.D.	0.02
1,1-Dichloroethene	mg/kg	N.D.	N.D.	100	N.D.	0.33
cis-1,2-Dichloroethene	mg/kg	0.080	6.0	100	0.67	0.25
trans-1,2-Dichloroethene	mg/kg	N.D.	N.D.	100	N.D.	0.19
Ethylbenzene	mg/kg	0.003 J	8.0	41	2.1	1
Isopropylbenzene	mg/kg	0.002 J	1.3	NS	0.33	NS
Methyl Acetate	mg/kg	N.D.	1.3	NS	0.20 J	NS
Methyl Tertiary Butyl Ether	mg/kg	N.D.	N.D.	100	N.D.	0.93
Methylcyclohexane	mg/kg	0.024	0.99	NS	0.47	NS
Methylene Chloride	mg/kg	0.006	N.D.	100	N.D.	0.05
Tetrachloroethene	mg/kg	N.D.	0.51	19	0.062 J	1.3
Toluene	mg/kg	0.027	30	100	7.7	0.7
1,1,1-Trichloroethane	mg/kg	0.007	0.66	100	N.D.	0.68
Trichloroethene	mg/kg	0.067	29	21	0.81	0.47
Vinyl Chloride	mg/kg	0.004 J	0.28	0.9	N.D.	0.02
Xylene (Total)	mg/kg	0.012	47	100	12	1.6
Analytical Parameter	Units	Composite 1	Composite 2	NYSDEC CP-51 Treatment Goal	Composite 3	NYSDEC CP-51 Treatment Goal
		NG-C1-01	NG-C2-01		NG-C3-01	
Total PCBs	mg/kg	29	11	< 2 ft: 1 2-10ft: 10 >10 ft: 50	4.2	< 2 ft: 1 2-10ft: 10 >10 ft: 50
Analytical Parameter	Units	Composite 1	Composite 2	NYSDEC Part 375 Restricted Residential SCO	Composite 3	NYSDEC Part 375 Restricted Residential SCO
		NG-C1-01	NG-C2-01		NG-C3-01	
Arsenic	mg/kg	7.0	3.6 J	16	3.5 J	16
Cadmium	mg/kg	7.2	13	4.3	2.9	4.3
Chromium	mg/kg	254	1,730	180	220	180

NS: Standard not Specified in \*Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4 (e)

N.D.: Not Detected

J: J-Flag represents Estimated Value

Parameter Exceeds Treatment Goal

Exceeds PCB treatment goal for 0-10 ft bls

Exceeds PCB treatment goal for 0-2 ft bls

**Soil Particle Size Distribution**

Fraction	Composite C1	Composite C2	Average
	SW1+SW2+SW3 (0 - 30 ft)	SW4+SW5 (0 - 30 ft)	
	Distribution	Distribution	Distribution
	(%)	(%)	(%)
+12.5 mm	8.9%	10.4%	9.6%
4.75-12.5 mm	13.4%	15.1%	14.3%
2.0-4.75 mm	14.3%	15.7%	15.0%
1.0-2.0 mm	11.8%	12.7%	12.3%
0.5-1.0 mm	17.4%	19.8%	18.6%
0.25-0.5 mm	16.4%	15.3%	15.8%
0.125-0.25 mm	4.8%	3.7%	4.3%
0.063-0.125mm	2.1%	1.6%	1.8%
0.038-0.063 mm	2.0%	0.9%	1.5%
<0.038 mm (fines)	8.7%	4.8%	6.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Projected Soil Washing Plant Product Mass Distribution on Dry Weight Basis**

Product	Composites 1 & 2 (0-30 ft)
	Average
Washed Gravel (>2.0 mm)	38.9%
Washed Sand (0.063 - 2.0 mm)	52.8%
Fines (<0.063 mm)	8.3%
<b>Total</b>	<b>100.0%</b>

**Boring SW1 (0 – 30 ft) – Soil Lithology**

Soil Core Sample as Received	Oversize Fraction +12.5 mm (+0.5")	Comments
		Gravelly Sand No odor
		Gravelly Sand "Very Light" VOC odor
		Gravelly Sand No odor
		Gravelly Sand No odor
		Gravelly Sand No odor
		Gravelly Sand No odor

**Boring SW2 (0 – 30 ft) – Soil Lithology**

Soil Core Sample as Received	Oversize Fraction +12.5 mm (+0.5")	Comments
		Gravelly Sand No odor
		Gravelly Sand "Very Light" VOC odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC odor

**Boring SW4 (0 – 30 ft) – Soil Lithology**

Soil Core Sample as Received	Oversize Fraction +12.5 mm (+0.5")	Comments
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Moderate" VOC Odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC odor



**Boring SW4 (30 – 50 ft) – Soil Lithology**

Soil Core Sample as Received	Oversize Fraction +12.5 mm (+0.5")	Comments
		Gravelly Sand "Light" VOC odor
		Gravelly Sand with "Light" VOC odor
		Silty Clay with some Sand and Gravel
		Silty Clay with some Gravel

**Boring SW5 (0 – 50 ft) – Soil Lithology**

Soil Core Sample as Received	Oversize Fraction +12.5 mm (+0.5")	Comments
		Gravelly Sand No odor
		Gravelly Sand No odor
		Gravelly Sand "Light" VOC odor
		Gravelly Sand "Light" VOC Odor
		Gravelly Sand No odor
		Gravelly Sand "Very Light" odor

**Boring SW4 (30 – 50 ft) – Soil Lithology**

Soil Core Sample as Received	Oversize Fraction +12.5 mm (+0.5")	Comments
		Gravelly Sand "Light" VOC odor
		Gravelly Sand with "Light" VOC odor
		Silty Clay with some Sand and Gravel
		Silty Clay with some Gravel



Composite 1 - Washed Gravel Soil Fraction 2.0 - 25 mm



Composite 1 - Sand after Hydraulic Separation



Composite 1 - Dewatered Fines Filter Cake



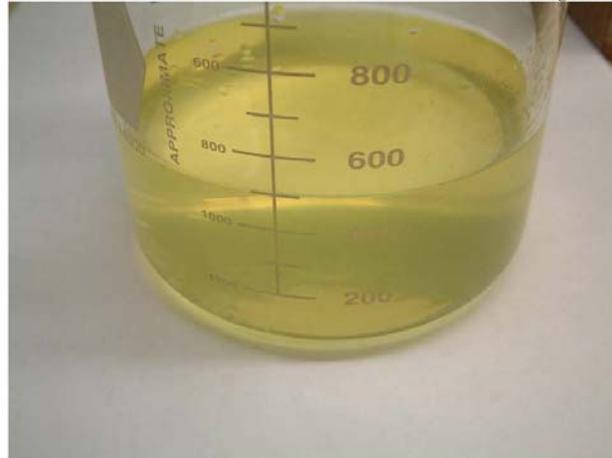
Composite 2 - Washed Gravel Soil Fraction 2.0 - 25 mm



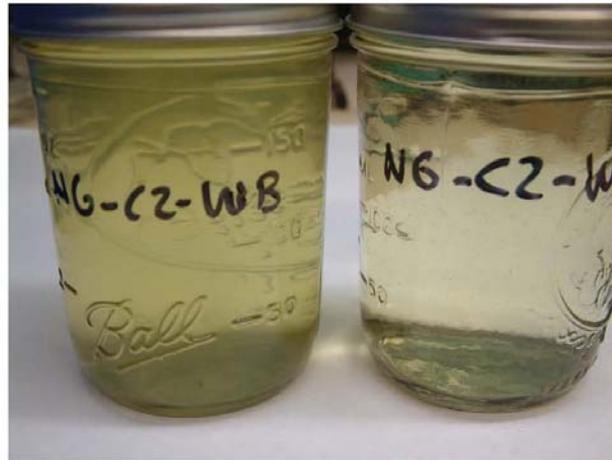
Composite 2 - Sand after Hydraulic Separation



Composite 2 - Dewatered Fines Filter Cake



Composite 2 – Process Water after Flocculation



Composite 2 – Untreated Process Recycle Water (Left) vs. Oxidized Process Water (Right)

Interim Report

Table 2: Results Basic Soil Washing Separation - Composite 1

Analytical Parameter	Units	Soil < 12.5 mm	Oversize 2.0-12.5 mm	Sand after Hydraulic Separation	Sand after Hydraulic Separation & Scrubbing	Fines Filter Cake	NYSDEC Part 375 Restricted Residential SCO (0 - 40 ft)
		NG-C1-01	NG-C1-02	NG-C1-03	NG-C1-05	NG-C1-04	
Acetone	mg/kg	0.014 J	N.D.	0.044	0.051	0.028 J	100
Benzene	mg/kg	N.D.	0.001 J	0.002 J	0.001 J	N.D.	4.8
Methyl Ethyl Ketone (2-Butanone)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Carbon Disulfide	mg/kg	0.003 J	N.D.	N.D.	N.D.	0.004 J	NS
Carbon Tetrachloride	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	2.4
Chlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Chloroform	mg/kg	N.D.	N.D.	N.D.	N.D.	0.006 J	49
1,2-Dichlorobenzene	mg/kg	0.002 J	N.D.	N.D.	N.D.	0.002 J	100
1,3-Dichlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	49
1,4-Dichlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	13
1,1-Dichloroethane	mg/kg	0.003 J	N.D.	N.D.	N.D.	0.013 J	26
1,2-Dichloroethane	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	3.1
1,1-Dichloroethene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
cis-1,2-Dichloroethene	mg/kg	0.080	0.021	0.035	0.022	0.49	100
trans-1,2-Dichloroethene	mg/kg	N.D.	N.D.	N.D.	N.D.	0.003 J	100
Ethylbenzene	mg/kg	0.003 J	0.006	0.013	0.009	0.048	41
Isopropylbenzene	mg/kg	0.002 J	N.D.	N.D.	N.D.	0.005 J	NS
Methyl Acetate	mg/kg	N.D.	0.004 J	N.D.	N.D.	N.D.	NS
Methyl Tertiary Butyl Ether	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Methylcyclohexane	mg/kg	0.024	N.D.	0.002 J	N.D.	0.040	NS
Methylene Chloride	mg/kg	0.006	N.D.	0.003 J	0.004 J	N.D.	100
Tetrachloroethene	mg/kg	N.D.	0.007	0.016	0.010	0.009	19
Toluene	mg/kg	0.027	0.050	0.024	0.064	0.14	100
1,1,1-Trichloroethane	mg/kg	0.007	N.D.	N.D.	N.D.	0.004 J	100
Trichloroethene	mg/kg	0.067	0.072	0.100	0.062	5.6	21
Vinyl Chloride	mg/kg	0.004 J	N.D.	0.002 J	N.D.	0.017	0.9
Xylene (Total)	mg/kg	0.012	0.013	0.028	0.041	0.097	100
<b>Total PCBs</b>	<b>mg/kg</b>	<b>29</b>	<b>2.1</b>	<b>7.1</b>	<b>3.0</b>	<b>130</b>	< 2 ft: 1 2-10ft: 10 >10 ft: 50
<b>Metals</b>							
Arsenic	mg/kg	7.0	2.2 J	0.92 J	1.1 J	19	16
Cadmium	mg/kg	7.2	0.93	0.85 J	0.42 J	37	4.3
Chromium	mg/kg	254	18	22	79	1,650	180

NS: Standard not Specified in "Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4 (e)

N.D.: Not Detected

J: J-Flag represents Estimated Value

Parameter Exceeds Treatment Goal

Soil Parameters Meet Backfill Criteria for > 2 ft. b/s

Interim Report

Table 3: Results Basic Soil Washing Separation - Composite 2

Analytical Parameter	Units	Soil < 12.5 mm	Oversize 2.0-12.5 mm	Sand after Hydraulic Separation	Sand after Hydraulic Separation & Scrubbing	Fines Filter Cake	NYSDEC Part 375 Restricted Residential SCO (0 - 40 ft)
		NG-C2-01	NG-C2-02	NG-C2-03	NG-C2-05	NG-C2-04	
Acetone	mg/kg	N.D.	0.018 J	N.D.	N.D.	N.D.	100
Benzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	4.8
Methyl Ethyl Ketone (2-Butanone)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Carbon Disulfide	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	NS
Carbon Tetrachloride	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	2.4
Chlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Chloroform	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	49
1,2-Dichlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
1,3-Dichlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	49
1,4-Dichlorobenzene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	13
1,1-Dichloroethane	mg/kg	0.096 J	N.D.	N.D.	N.D.	0.24 J	26
1,2-Dichloroethane	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	3.1
1,1-Dichloroethene	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
cis-1,2-Dichloroethene	mg/kg	6.0	0.043	1.0	0.72	23	100
trans-1,2-Dichloroethene	mg/kg	N.D.	N.D.	N.D.	N.D.	0.10 J	100
Ethylbenzene	mg/kg	8.0	0.076	1.8	0.76	16	41
Isopropylbenzene	mg/kg	1.3	0.011	0.37	0.18 J	2.8	NS
Methyl Acetate	mg/kg	1.3	N.D.	0.12 J	0.12 J	1.6	NS
Methyl Tertiary Butyl Ether	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Methylcyclohexane	mg/kg	0.99	0.003 J	0.21 J	0.066 J	1.3	NS
Methylene Chloride	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Tetrachloroethene	mg/kg	0.51	0.011	0.34	0.15	2.8	19
Toluene	mg/kg	30	0.24	4.5	1.5	35	100
1,1,1-Trichloroethane	mg/kg	0.66	0.005 J	0.14 J	N.D.	1.4	100
Trichloroethene	mg/kg	29	0.15	3.4	1.1	35	21
Vinyl Chloride	mg/kg	0.28	0.002 J	0.094 J	0.095 J	0.31 J	0.9
Xylene (Total)	mg/kg	47	0.48	12	5.3	84	100
Total PCBs	mg/kg	11	2.6	1.0	3.6	58	< 2 ft: 1 2-10ft: 10 >10 ft: 50
<b>Metals</b>							
Arsenic	mg/kg	3.6 J	1.7 J	3.8 J	N.D.	15	16
Cadmium	mg/kg	13	1.5	2.9	2.2	180	4.3
Chromium	mg/kg	1,730	373	423	390	2,490	180

NS: Standard not Specified in "Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4 (e)

N.D.: Not Detected

J: J-Flag represents Estimated Value

Parameter Exceeds Treatment Goal

Soil Parameters Meet Backfill Criteria for > 2 ft bis